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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Takumi ITO, et al.

Title: TRANSMITTER APPARATUS, RECEIVER APPARATUS, AND  
RADIO COMMUNICATION SYSTEM

Appl. No.: 10/564,552

International 07/16/2004  
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Examiner: Shaima Q. Aminzay

Art Unit: 2618

Confirmation 1857  
Number:

**INFORMATION DISCLOSURE STATEMENT**  
**UNDER 37 CFR §1.56**

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Submitted herewith on Form PTO/SB/08 is a listing of documents known to Applicants in order to comply with Applicants' duty of disclosure pursuant to 37 CFR §1.56.

A copy of each non-U.S. patent document and each non-patent document is being submitted to comply with the provisions of 37 CFR §1.97 and §1.98.

The submission of any document herewith, which is not a statutory bar, is not intended as an admission that such document constitutes prior art against the claims of the present application or that such document is considered material to patentability as defined in 37 CFR §1.56(b). Applicants do not waive any rights to take any action which would be appropriate to antedate or otherwise remove as a competent reference any document which is determined to be a *prima facie* art reference against the claims of the present application.

**TIMING OF THE DISCLOSURE**

The listed documents are being submitted in compliance with 37 CFR §1.97(d), before payment of the issue fee.

**RELEVANCE OF EACH DOCUMENT**

The documents listed on the attached PTO/SB/08 were cited as being relevant during the prosecution of the corresponding Japanese application. A partial English translation of the Japanese Office Action of June 3, 2009, follows:

Claims 7-9, 11-14, 16, 18-20, 22-27

Cited references 1-5

Remarks

<Claims 7, 11, 12 and 16>

Cited reference 1 is known by describing a system with multiple transceiving antennas having a transceiving system to calculate physical quantity of pilot signal after demodulation from estimated vector estimated from channel matrix and conduct adaptation modulation at the transmitting end based on feedback information.

Also, it is common technology as is known in the art that determine transmission parameter from physical quantity calculated at a receiving end and transmit determined transmission parameter to a transmitting end (e.g. cited reference 2 page 2, line 8 to 18).

Therefore, one of ordinary skill in the art can easily achieve structures as claimed in claim 7, 11, 12 and 16 through invention described in cited reference 1.

<Claims 18 and 22>

It is a common technology as is known in the art to estimate channel information by sending pilot signal to from the

receiving end to the transmitting end when signal channel column detected by receiving signal become identical with signal channel column detected by a transmission devise (e.g. see cited reference 3, paragraph [0045]). Therefore, one of ordinary skill in the art can easily achieve structures as claimed in claim 18 and 22 through invention described in cited reference 1.

<Claim 8, 13, 19>

Using SNR as a physical quantity to evaluate wireless quality is known in the art (see reference 4, paragraph [1221] – [1232]), therefore using SNR instead of CNR as shown in cited reference 1 is just a technical matter within designing range for one of ordinary skill in the art.

In this case as shown in cited reference 1, because signal electricity and noise power are detected based on only a channel computed from channel columns, SNR can be computed based on channel columns.

<Claims 9, 14, 20>

Cited reference 1 describes calculation method for physical quantity based on average signal power.

Average signal power is calculated by total signal power divided by signal number so that it is just a technical designing matter for one of ordinary skill in the art to use total signal power instead of average electronic power.

<Claim 23, 24-27>

TDD system having same channel for ups and downs of MIMO channel is common technology in the art (see cited reference 2, paragraph [1045]; cited reference 5, claim 5; and Abstract), therefore using MIMO system in TDD is also common technology in the art.

Cited reference list

1. Y. TENG et al., “Performance Analysis of SDM-OFDM System with Adaptive Modulation Method over MIMO Channels,” The Institute of Electronics, May 23, 2003, vol. 103, N. 66, pp. 75-82.
2. WO 03/050968

3. WO 02/073916
4. WO 03/041300
5. WO 03/005606

Document B1 is a U.S. counterpart of Document B2. A copy of Document B6 is not enclosed as this document was provided with Applicant's IDS of February 10, 2006.

Any document listed on the attached PTO/SB/08 was cited as being relevant during the prosecution of the corresponding Japanese application. A copy of the Japanese Office is attached.

Applicants respectfully request that each listed document be considered by the Examiner and be made of record in the present application and that an initialed copy of Form PTO/SB/08 be returned in accordance with MPEP §609.

#### **STATEMENT**

The undersigned hereby states in accordance with 37 CFR §1.97(e)(1) that each item of information contained in this information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three (3) months prior to filing of this Statement.

The undersigned hereby states in accordance with 37 CFR §1.704(d) that each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart application and that this communication was not received by any individual designated in 37 CFR §1.56(c) more than thirty days prior to the filing of the information disclosure statement.

#### **FEE**

A credit card payment form in the amount of \$180.00 is enclosed to cover the fee associated with an information disclosure statement under 37 CFR §1.97(d).

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this submission under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment,

to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment form being unsigned, providing incorrect information resulting in a rejected credit card transaction, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741.

Respectfully submitted,

Date: June 16, 2009

By  \_\_\_\_\_

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